

Research and Monitoring Action Plan



Introduction

Research and long-term monitoring are essential to achieving the Sanctuary's primary goal. Although past research efforts have made significant advances in characterizing and monitoring humpback whales and their habitat, many unanswered questions and unknowns concerning habitat requirements, population size, distribution and dynamics, threats and impacts, and other important biological and ecological parameters remain. Research efforts funded or coordinated by the Sanctuary will focus on the Sanctuary and its surrounding area; efforts will be made as appropriate to collaborate with researchers working in other parts of the humpback whale's range around the world.

This action plan provides research and long-term monitoring strategies intended to help answer and clarify pressing scientific questions and unknowns. The interrelated strategies presented below are designed to (1) assess and monitor important population parameters of humpback whales and their endangered species recovery status; (2) assess and monitor the ecological condition of humpback whale habitat; (3) differentiate between natural and anthropogenic impacts on the whales and their habitat; (4) inform the development and implementation of effective conservation and management strategies; and (5) effectively administer and communicate the results of Sanctuary supported research projects.

This action plan provides the strategies (Tables 8 and 9A/B and Figure 5) that will be used to facilitate research and monitoring in the Sanctuary. The following sections discuss each strategy in detail. This action plan responds to Goal 2: *Promote and coordinate research to enhance the understanding of humpback whales and their habitat and to improve management decision-making.*

Outcomes and Performance Indicators

RM Outcome 1: By the end of 2005, the Sanctuary will maintain and improve its use of research and monitoring information in its decision-making processes, as indicated by:

- Periodic reports/estimates of humpback whale abundance in the main Hawaiian Islands.
- A completed research study on threats by the end of 2004.
- A completed workshop on threats completed by the end of 2005.
- A more prominent role for the SAC in providing recommendations related to research and monitoring.

RM Outcome 2: By the end of 2006, the Sanctuary will have improved its administration and promotion of research and monitoring projects, as indicated by:

- Increased numbers of research results published in peer-reviewed publications by the end of 2006.
- Developed data storage and management system(s) by the end of 2006.
- Improved coordination of research and monitoring activities with education and outreach activities.



Table 8: Summary of Research and Monitoring Strategies and Activities

Strategies	Activities
RM-1: Characterize and monitor the central North Pacific stock of humpback whales.	<p>A. Continue to monitor and estimate the numerical abundance of humpback whales in the main Hawaiian Islands.</p> <p>B. Continue to examine and describe the spatial and temporal aspects of humpback whale distribution, movement, and demography in the main Hawaiian Islands.</p> <p>C. Continue to examine and describe the humpback whale life cycle, and the nature, frequency, and function of humpback whale behavior.</p>
RM-2: Characterize and monitor whale habitat and behavior, including natural and anthropogenic factors affecting them.	<p>A. Assess and monitor existing and potential threats and impacts to humpback whales and their habitat.</p> <p>b. Maintain a data and information system to store humpback whale research data.</p>
RM-3: Improve the administration of research projects.	<p>A. Establish administrative procedures of identifying, selecting, funding, and managing research projects.</p> <p>B. Determine the role of the SAC in research planning.</p> <p>C. Conduct ongoing project evaluation and management review to regularly update research needs and priorities.</p>
RM-4: Enhance communications among researchers, resource managers, and the public.	<p>A. Create opportunities for facilitating communication with research and education communities, user groups, and the public.</p>



Figure 5: Timeframe of RM Strategies and Activities

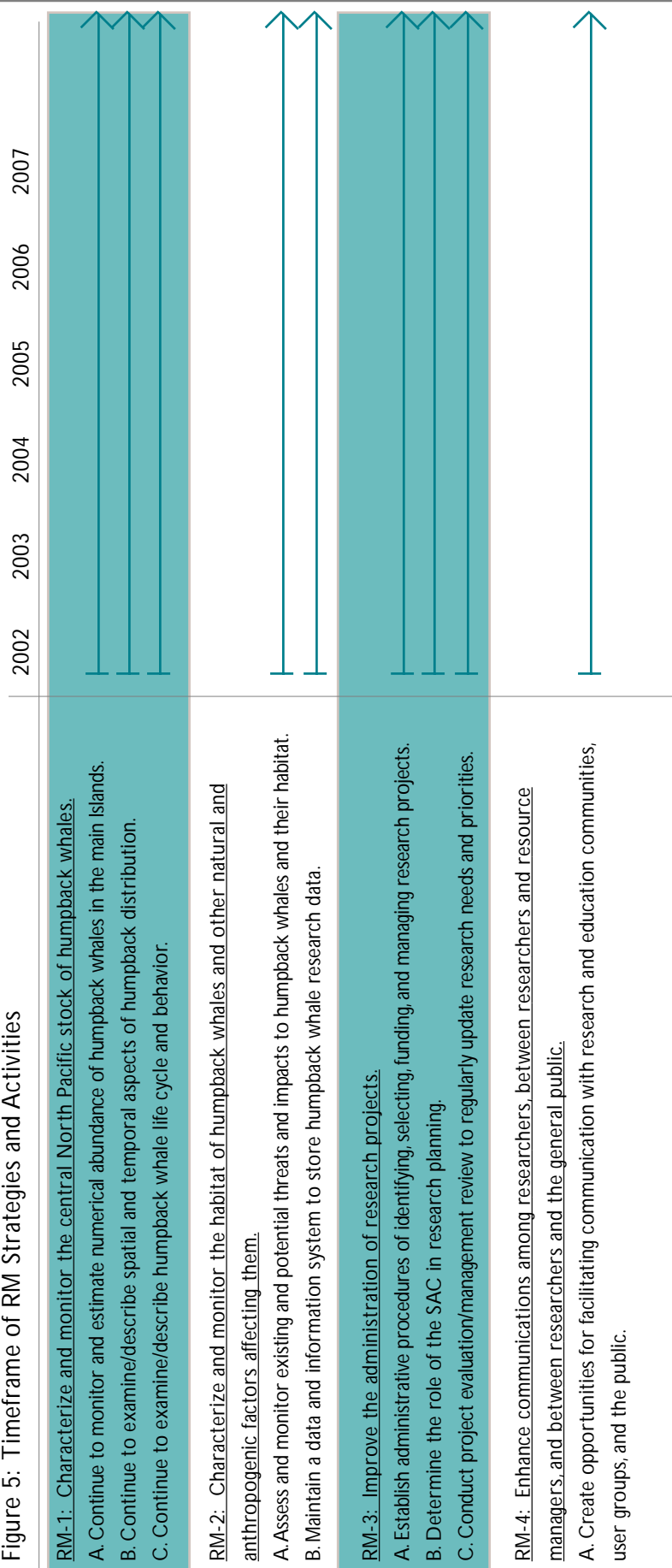


Table 9A: Estimated One Time Only Costs (in \$1000s) for RM Strategies and Activities

Strategy and Activity		Personnel	Travel	Printing	Equipment & Supplies	Contract	One-Time Only Costs
RM-1 Characterize and monitor humpback whales							
RM-1A	Continue to monitor humpback whales.	-	-	-	-	-	-
RM-1B	Continue to examine distribution.	-	-	-	-	-	-
RM-1C	Continue to examine life cycle and behavior.	-	-	-	-	-	-
RM-2 Characterize and monitor the habitat and factors affecting humpback whales							
RM-2A	Monitor threats/impacts to humpback whales.	-	-	-	-	-	-
RM-2B	Maintain a data and information system.	-	-	-	-	-	-
RM-3 Improve administration of research projects							
RM-3A	Establish administrative procedures for research.	12.5	-	-	-	-	12.5
RM-3B	Determine role of SAC in research planning.	5.0	-	-	-	-	5.0
RM-3C	Conduct review to update research priorities.	9.4	-	-	-	15.0	24.4
RM-4 Enhance communication among researchers and the public							
RM-4A	Create opportunities for enhancing communication.	-	-	5.0	-	-	-

Table 9B: Estimated Annual Costs (in \$1000s) for RM Strategies and Activities

Strategy and Activity		Personnel	Travel	Printing	Equipment & Supplies	Contract	One-Time Only Costs
RM-1 Characterize and monitor humpback whales							
RM-1A	Continue to monitor humpback whales.	-	-	-	-	-	-
RM-1B	Continue to examine distribution.	-	-	-	-	-	-
RM-1C	Continue to examine life cycle and behavior.	-	-	-	-	-	-
RM-2 Characterize and monitor the habitat and factors affecting humpback whales							
RM-2A	Monitor threats/impacts to humpback whales.	-	-	-	-	-	-
RM-2B	Maintain a data and information system.	-	-	-	-	-	-
RM-3 Improve administration of research projects							
RM-3A	Establish administrative procedures for research.	12.5	-	-	-	-	12.5
RM-3B	Determine role of SAC in research planning.	5.0	-	-	-	-	5.0
RM-3C	Conduct review to update research priorities.	9.4	-	-	-	15.0	24.4
RM-4 Enhance communication among researchers and the public							
RM-4A	Create opportunities for enhancing communication.	-	-	5.0	-	-	-

Strategies

RM-1: CHARACTERIZE AND MONITOR THE CENTRAL NORTH PACIFIC STOCK OF HUMPBACK WHALES



Strategy Summary

A primary goal of the Sanctuary's research and monitoring program is to improve understanding of the central North Pacific population of humpback whales and their wintering habitat. The Sanctuary will work to further develop and support comprehensive studies and surveys needed to better understand the humpback whale's population dynamics in breeding areas around the main Hawaiian Islands. The Sanctuary will seek to improve baseline information on a variety of important characteristics of humpback whale biology (e.g., abundance, distribution, movement, behavior, age at sexual maturity, pregnancy rates, variability in reproductive success, calving intervals, age-specific mortality and survivorship rates, longevity, and interrelationships with its Hawaiian habitat).

This strategy addresses Objective 2.1, to develop a detailed research and monitoring plan.

Activities

Activity A: Continue to monitor and estimate the numerical abundance of humpback whales in the main Hawaiian Islands.

To assist in stock assessment and related abundance measurements, the frequency and spatial coverage of aerial, vessel-based, and shore-based surveys should be increased. Other remote sensing and acoustical methods of measuring abundance should be examined.

Activity B: Continue to examine and describe the spatial and temporal aspects of humpback whale distribution, movement and demography in the main Hawaiian Islands.

Priority projects should examine and characterize (1) spatial distribution of whales in and around the Sanctuary at regular time intervals during the "whale season" (November through April); (2) temporal and spatial characteristics of the migratory parade to and from Hawai'i; and (3) variation in population demographics between habitats, in terms of sex, age and reproductive status.

Activity C: Continue to examine and describe the humpback whale life cycle, and the nature, frequency, and function of humpback whale behavior.

Priority research areas are: (1) effects of sex and reproductive status on individual whale movements; (2) characteristics and functions of social groupings; (3) long-term monitoring, using mark-recapture and other techniques, to identify and track individual whales to better understand life history, longevity and other demographic characteristics; (4) acoustic communication, including "singing," mother-calf vocal exchanges and other social sounds; and (5) mortality rates and calving intervals.





Estimated Timeframe

See Figure 5 for an overview of the anticipated scheduling of these strategies. In general each of the activities in this strategy are expected to take the following amounts of time:

- Activity A: throughout the plan period.
- Activity B: throughout the plan period.
- Activity C: throughout the plan period.

Estimated Costs

See Table 9 for an overview of the anticipated costs of these strategies.

Products

- Research reports
- Distribution maps and geographic information system layers
- Video and still images of habitat and resources
- Acoustic data
- Source information and images for education and outreach materials
- Lecture series

Partners

- DLNR and other State of Hawai'i agency staff
- NOAA Fisheries
- Sanctuary Advisory Council
- Academic institutions
- Other non-governmental and non-academic organizations conducting scientific research

Related Strategies

- EO-1: Assess, enhance, and implement existing education and outreach programs.



RM-2: CHARACTERIZE AND MONITOR THE HABITAT AND BEHAVIOR OF HUMPBACK WHALES INCLUDING THE NATURAL AND ANTHROPOGENIC FACTORS AFFECTING THEM

Strategy Summary

The Sanctuary will direct efforts to monitor humpback whales and their habitat to help detect and determine the probable or possible causes of changes (natural and human-caused) that may affect humpback whales including distinct changes in their distribution, abundance, age-sex composition, and habitat use patterns. Program efforts may also incorporate experimental designs that can help discern future changes and trends in the vital parameters and the important habitats and habitat components of the humpback population that winters in the Hawaiian Islands. These efforts will assist in determining any future boundary modifications that may become necessary to adequately protect humpback whales in Hawai'i.

This strategy addresses Objective 1.1, to identify and reduce threats to the humpback whale and its habitat, and Objective 2.1, to help develop a detailed research and monitoring program.

Activities

Activity A: Assess and monitor existing and potential threats and impacts to humpback whales and their habitat.

A research study and workshop will be conducted to assess current and potential threats to humpback whales and their habitat within and around the Sanctuary. Such threats may include acoustics, thrillcraft operation, overflights, degraded water quality, marine debris, ocean dumping, other ocean pollution, and increased human activity on the water. For example, studies may investigate cause and effect relationships of how noise, and vessel or aircraft movement, speed, type, and density impact humpback whales. The Sanctuary will conduct these activities in coordination with partner agencies and academic and research institutions.

Activity B: Maintain a data and information system to store humpback whale research data for the Sanctuary and surrounding areas, and collaborate with others on additional databases, including those for whale identification.

The Sanctuary will work with researchers and government agencies to determine the best way to facilitate research information storage and retrieval, including whale fluke identification photos.

Estimated Timeframe

See Figure 5 for an overview of the anticipated scheduling of these strategies. In general each of the activities in this strategy are expected to take the following amounts of time:

- Activity A: Throughout the plan period.
- Activity B: Throughout the plan period.



Estimated Costs

See Table 9 for an overview of the anticipated costs of these strategies.

Products

- Research reports.
- Data storage and management systems.
- Workshops, including a threat assessment workshop.
- Threat assessment study.

Partners

- DLNR and other State of Hawai'i agency staff
- NOAA Fisheries including the National Marine Mammal Laboratory
- Marine Mammal Commission
- Other Federal and State agency staff as appropriate
- Sanctuary Advisory Council
- Academic institutions

Related Strategies

- NRP-3: Obtain and share relevant information about Sanctuary uses, use policies, and regulations.



RM-3: IMPROVE THE ADMINISTRATION OF RESEARCH PROJECTS



Strategy Summary

Strategy RM-3 addresses the Sanctuary's Objective 2.2 to improve the administration of Sanctuary-funded research projects. The Sanctuary will work to establish procedures for identifying, selecting, and sponsoring research projects to ensure that the research topics are responsive to management concerns and that research results contribute to improved management decision-making in the Sanctuary.

Activities

Activity A: Establish administrative procedures of identifying, selecting, funding, and managing research projects.

The Sanctuary will hire a research coordinator to draft Sanctuary Requests for Proposals, establish selection criteria for research projects, establish policies to prevent conflict of interest, establish reporting and publishing guidelines, monitor the quality of ongoing research, and distribute preliminary findings for peer review (including select SAC members). The Research Coordinator will also be responsible for ensuring that all appropriate information regarding permit requirements for both Sanctuary and NOAA Fisheries permits are provided to researchers.

The Sanctuary will consult with NOAA Fisheries and the National Marine Mammal Laboratory to ensure that all proposed research supported by and/or conducted within the Sanctuary is complementary to other research efforts in the Pacific and consistent with the provisions of the Endangered Species Act and Marine Mammal Protection Act with regard to minimizing research-related negative impacts on humpback whales and their habitat.

Activity B: Determine the role of the SAC in research planning.

Clarify the SAC's and the SAC Research Working Group's role for providing advice on the identification, selection, and sponsorship of Sanctuary research projects.

Activity C: Conduct ongoing project evaluation and management review to regularly update research needs and priorities.

The Sanctuary will develop a process to annually evaluate the effectiveness and efficiency of Sanctuary research projects and its integration with other resource protection and education objectives.

The Sanctuary will also coordinate with NOAA Fisheries' Pacific Islands Area Office and the State of Hawai'i to monitor humpback whale research in the Sanctuary. The Sanctuary will assist NOAA Fisheries and the State of Hawai'i, as necessary, to maintain records of all current research, equipment being used on the site, frequency of researchers' visits to the site, and progress to date on each current research project.





Estimated Timeframe

See Figure 5 for an overview of the anticipated scheduling of these strategies. In general each of the activities in this strategy are expected to take the following amounts of time:

- Activity A: Throughout the plan period.
- Activity B: Throughout the plan period.
- Activity C: Throughout the plan period.

Estimated Costs

See Table 9 for an overview of the anticipated costs of these strategies.

Products

- Annual research and monitoring work plans.
- Annual research and monitoring priorities lists and descriptions.
- Report on administrative procedures for project selection and management.

Partners

- Sanctuary research staff
- NMSP HQ research staff
- Sanctuary Advisory Council
- NOAA Fisheries' Pacific Islands Area Office

Related Strategies

- NRP-2: Enhance project and permit review procedures.



RM-4: ENHANCE COMMUNICATIONS AMONG RESEARCHERS, RESOURCE MANAGERS, AND THE PUBLIC



Strategy Summary

Strategy RM-4 addresses the Sanctuary's Objective 2.3 to encourage information exchange among researchers, resource managers, and the public. The Sanctuary will explore ways to encourage information exchange among organizations and agencies undertaking management-related research in the Sanctuary to promote more informed management and decision-making.

Activities

Activity A: Create opportunities for facilitating communication with research and education communities, user groups, and the public.

The Sanctuary will explore opportunities to facilitate communication between researchers, educators, user groups, and the public to promote mutual understanding of each other's role in encouraging public knowledge and appreciation of humpback whales and their habitat. Such opportunities may include a research website, regularly produced research summary reports, a research newsletter, support for publication of research findings in peer-reviewed scientific journals, and informational workshops and seminars that include researchers, resource managers, educators, and the public. The Sanctuary will also continue to seek opportunities to broadcast coverage of Sanctuary activities including lecture series with researchers on public access television.

The Sanctuary will continue to develop cooperative teacher enrichment programs to facilitate the transfer of information in science, math, environmental and social studies (including the Hawaiian culture) in K-12 programs in partnership with local education and conservation organizations.

Estimated Timeframes

See Figure 5 for an overview of the anticipated scheduling of these strategies. In general each of the activities in this strategy are expected to take the following amounts of time:

- Activity A: Throughout the plan period.

Estimated Costs

See Table 9 for an overview of the anticipated costs of these strategies.

Products

- Summary reports on Sanctuary-supported research and monitoring projects.
- Web pages regarding research and monitoring.
- Research and monitoring newsletter.
- Broadcasts of lectures and other research and monitoring activities.





Partners

- DLNR and other State of Hawai'i agency staff
- NOAA Fisheries and other Federal agency staff
- Sanctuary Advisory Council

Related Strategies

- EO-1: Assess, enhance, and implement existing education and outreach programs.

